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PATENT SPECIFICATION

(11) 1 494 109

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- (21) Application No. 56054/74 (22) Filed 30 Dec. 1974
 (31) Convention Application No. 2365172
 (32) Filed 29 Dec. 1973 in
 (33) Federal Republic of Germany (DT)
 (44) Complete Specification published 7 Dec. 1977
 (51) INT CL³ C11D 3/60 A61L 13/00 C07C 135/02 D06L 3/02 (C11D 3/60 3/20 3/26 3/395)



(52) Index at acceptance

CSD 6A5B 6A5C 6A5D1 6A5D2 6A5E 6A9 6B10A 6B12A
 6B12B1 6B12E 6B12G1 6B12G6 6B12N1 6B12N3 6B12P
 6B15 6B1 6B2 6B3 6B7 6B9 6C8
 A5E 1A2N1 1A2N4 1A2P 1A3A 1A5A1 1A5A2 1C15A3
 1C15A7 1C15B1 1C15F1 1C9A
 C2C 20Y 29X 29Y 30Y 334 364 36Y 796 799 79Y LZ
 DIP 1A1B4 1A3 1A5 1C1A 1C1X 1C4

(54) IMPROVEMENTS IN AND RELATING TO BLEACHING AGENTS

(71) We, HOECHST AKTIENGESELLSCHAFT, a body corporate organised according to the laws of the Federal Republic of Germany, of 6230 Frankfurt/Main 80, Postfach 80 03 20, Federal Republic of Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to bleaching compositions, especially to compositions which also have a detergent and a cleansing effect.

Aqueous solutions of inorganic peroxo compounds, particularly of those compounds containing hydrogen peroxide or perborates, have long been used as oxidation and bleaching agents for organic materials. These compounds are used above all as bleaching agents and as a component of detergent compositions for textile fabrics.

These solutions containing peroxo compounds have the disadvantage that the active oxygen of the peroxo compounds generally becomes effective, at a rate sufficient in practice, only at elevated temperatures, in the range from about 80 to 100°C, so that these oxidation, bleaching and detergent compositions are not suitable for treating materials which are sensitive to such temperatures.

It is known that inorganic peroxo compounds, for example sodium perborate, can be activated by adding reactive N - acyl or O - acyl compounds, which have been described, for example, in the German Patent Nos. 1 291 317 and the German Auslegungsschriften Nos. 1 162 967, 1 149 349, and 1 695 219, so that they show their bleaching effect at a temperature of less than 80°C. Suitable activators are among others N,N - diacetyl - p - chloroaniline, N,N - diacetyl -

p - toluidine, diacetylaniline, N,N' - diacetylhydrazine, N,N,N' - triacetylmethylene - diamine, tetra - acetyl - ethylene - diamine, tetra - acetyl - glycoluril, and hexa - acetyl - triethylene - tetramine.

These combinations of inorganic peroxo compounds and activators have the drawback that they must generally be used in high concentrations in order to produce the desired bleaching effect, and they have often proved unsuitable for use in practice for economic reasons. Besides, the secondary products obtained from bleaching agents and activators, for example sodium borate and ethylene diamine or glycoluril, do not show any detergent effect. It has, furthermore, been recently reported that cases of poisoning have been observed which are attributed to the resorption of the boric acid by the skin and mucous membranes. Symptoms of boric acid poisoning include gastric, intestinal, and renal disorders, as well as skin injuries (cf. Seife, Öle, Fette, Wachse, 2/ 780 (1971)).

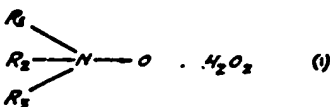
The present invention provides a bleaching composition which comprises an addition product of hydrogen peroxide with a tertiary amine oxide and a peroxide activator. Such compositions may be used for oxidation, detergent, cleansing, disinfecting and sterilising purposes, as well as for bleaching purposes by contacting a material with a composition of the invention.

This is especially useful in the treatment of textiles.

Advantageously, at least one of the substituents on the nitrogen atom of the tertiary amine oxide is an aliphatic group, especially a straight or branched chain alkyl group, of more than 7 carbon atoms, preferably of from 8 to 20 carbon atoms.

Advantageous addition productions of

hydrogen peroxide with a tertiary amine oxide are compounds of the general formula (I).



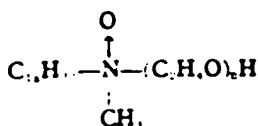
in which R_1 represents a straight or branched chain alkyl group of from 8 to 20, preferably from 12 to 18, carbon atoms; R_2 represents a straight or branched chain alkyl group of from 1 to 20, preferably from 1 to 4 or from 12 to 18, carbon atoms, or a group of the general formula $-(CH_2CHXO)_nH$, in which X represents a hydrogen atom or a methyl group and n lies in the range from 1 to 12, preferably from 1 to 6; and R_3 represents a straight or branched chain alkyl group of from 1 to 4 carbon atoms, or a group of the general formula



in which Y and m have one of the meanings given above for X and n respectively.

Preferably, especially in compositions according to the invention having detergent properties, one of the groups on the nitrogen atom of the amine oxide - hydrogen peroxide addition compounds is hydrophobic, or lipophilic.

Among suitable addition products there may be mentioned the hydrogen peroxide addition products of coconut oil alkyl dimethyl amine oxide, tallow oil alkyl dimethyl amine oxide, steryl methyl amine oxide polyglycol ether.



wherein n is as defined above, tetradecyl dimethyl amine oxide, dodecyl dimethyl amine oxide, and stearyl amine oxide decyl polyglycol ether.

Among suitable peroxide activators there may be mentioned reactive N - acyl or O - acyl compounds, for example those mentioned above.

The amine oxide hydrogen peroxide addition products used in a composition according to the invention can be obtained in a known manner by reacting the amine oxide with hydrogen peroxide. The preparation may be carried out in an aqueous, organic, or organo-aqueous phase. The reaction may be performed at a temperature of up to about 70°C, preferably at a temperature in the range from 10 to 40°C. The production of certain amine oxide - hydrogen peroxide addition products is described in U.S. Patent No. 3,252,979.

Advantageously, bleaching compositions according to the present invention contain from 5 to 30 per cent by weight, preferably from 10 to 20 per cent by weight of the addition products of hydrogen peroxide with amine oxides, from 5 to 30 per cent by weight, preferably from 10 to 20 per cent by weight of the activators for peroxy compounds, and from 40 to 90 per cent by weight of other components, such as anionic, non-ionic, or amphoteric detergent raw materials, builders giving a neutral to alkaline reaction, anti-redeposition agents, foam stabilizers, foam inhibitors, softening agents and optical brighteners.

It can generally be said that each acyl group present in the activator is able to activate an active oxygen atom of an organic peroxy compound, and therefore, for complete activation of the active oxygen of the addition product the activation agent and organic peroxy compound should, theoretically, be used in equivalent amounts, with respect to the acyl groups and active oxygen atoms. In practice, however, a considerably lower amount of activator may in many cases be sufficient. On the other hand, it is certainly possible to use a large excess of activators relative to the peroxy compound. In general, activators and peroxy compounds are used in quantities which correspond to a ratio of acyl radicals to active oxygen atoms in the range from 0.5:1 to 8:1, preferably from 1:1 to 4:1. In practice, the weight ratio of activator and peroxy compound generally lies in the range from 1:1 to 1:2.

In general, the compositions provided by the invention have the advantage that activation of the peroxy compound, with acceleration of the oxidation and bleaching processes, occurs even at lower temperatures, starting at about 20°C, in particular at a temperature in the range from 30 to 60°C, for example at about 40°C. The acceleration of oxidation and bleaching processes occurs at higher temperatures also, for example at about 75°C and even up to about 95°C. This activation and acceleration of the oxidation and bleaching processes makes it possible to use a lower working temperature and/or to operate for a shorter reaction time, while achieving the same effect.

A further advantage of the compositions provided by the present invention is their generally low toxicity.

The conditions to be observed in practice for carrying out the respective oxidation and/or bleaching processes, such as temperature and reaction time, the concentration of the organic peroxy compound and the activator, as well as the pH-value of the treatment solution, depend above all on the substrate to be oxidized or bleached, or on the accompanying material present in the bleaching process.

The compositions provided by the present invention are advantageously employed in aqueous medium. The concentration of the organic peroxo compound and, consequently, the concentration of the activator in the oxidation, bleaching, detergent, cleansing disinfecting and sterilizing liquors depend above all on the oxidation and/or bleaching effect desired. Generally, the concentration of the peroxo compounds is adjusted so that the liquids contain from 10 to 500, preferably from 50 to 300 mg of active oxygen per litre.

The compositions according to the invention can be used, for example, for the bleaching of wares, fat, oils, and hydrocarbons; for the oxidation and the passivation of light metal surfaces; for disinfection and sterilization; for the bleaching of hides, skins and hair, including human hair; and, especially important, for the washing and bleaching, or bleaching only, of fibres and textile materials of natural or synthetic origin.

Among fibres and textiles which may be treated with the compositions provided by the present invention, there may be mentioned cotton or linen materials (which are generally treated at higher temperatures, from 70 to 100°C) and especially materials comprising synthetic fibres, for example polyamide, polyester or polyacrylonitrile fibre (which are generally treated at lower temperatures, up to 70°C, preferably from 30 to 60°C). Materials which are generally treated at low temperatures also include materials with an easy-to-care finish that are made from cellulosic fibres, synthetic fibres, or mixtures thereof. The compositions provided by the invention generally allow satisfactory bleaching and washing to be carried out at the relatively low temperatures, which are necessary for the bleaching and washing of some textiles.

The hydrogen peroxide addition products and activators which are used in bleaching compositions according to the invention can be easily mixed, in the form of powders, granules or liquids, with other components normally used in such compositions. Other components are especially detergent raw materials, the so-called surfactants, generally used in a proportion of from 5 to 40, preferably 10 to 30 per cent by weight; builders, generally used in a proportion of from 10 to 80, preferably from 30 to 75 per cent by weight, and other detergent components and adjuvants, such as anti-redeposition agents, optical brighteners, dyestuffs, perfumes, and water, generally making up altogether a proportion of from 0 to 15, preferably from 1 to 10 per cent by weight.

The detergent raw materials or surfactants may either be uniform products or mixtures comprising anionic, non-ionic, or amphoteric compounds; they may, for example, consist

entirely of soaps or may contain about 10 to 50 per cent by weight of soaps derived from natural or synthetic fatty acids. They may further consist entirely of surface active compounds of the sulphate or sulphonate type or may contain these compounds in an amount of, preferably, about 30 to 70 per cent. Among surface active compounds of this type there may be mentioned alkyl - aryl - sulphonates and aliphatic sulphonates, for example secondary alkane sulphonates, alkene - sulphonates, and alkoxy - sulphonates, fatty alcohol sulphates, fatty acid alkylol amides, sulphation products of oxalkylated alkyl - phenols, fatty acid amides or fatty acid alkylol amides, preferably with a content of 1 to 20 ethoxy and/or propoxy groups per molecule, and sulphated fatty acid monoglycerides. Anionic surfactants suitable for use in detergents have been previously described in detail, for example in "Surface Active Agents and Detergents" by Schwartz, Perry and Berch, Vol. II (1958), pages 25 to 102.

The surfactants used in the compositions according to the invention may either consist entirely of non-ionic detergent raw materials or they may contain these materials, preferably in an amount of from about 5 to 50 per cent by weight. In a composition for detergent use, the water solubility of the hydrophobic molecule moiety, which generally contains from 8 to 25 carbon atoms is brought about, in the simplest case, by the use of polyglycol ether chains. These non-ionic detergent basic materials have also been previously described, for example, in "Surface Active Agents and Detergents", Vol. II (1958), pages 120 to 143.

In addition to non-ionic and anionic or amphoteric detergent raw materials, the compositions of the invention for detergent use may also contain small amounts, advantageously up to 8 per cent by weight, of foam stabilizers or foam inhibitors. The foaming power of the synthetic anionic or non-ionic detergent raw materials may be reduced also by adding soaps. With certain combinations of synthetic anionic surfactants, non-ionic surfactants and soap the tendency to foam is substantially reduced. The same applies also, for example, to the addition products of propylene oxide on surface active polyethylene glycol ethers.

Another important component which may be used in compositions having detergent properties are the so-called builders. In general at least part of these builders used in such compositions should give an alkaline reaction. For the rest, the builders may be inorganic or organic salts which give a weakly acid, neutral, or alkaline reaction, especially salts having complexing properties. Useful builders are, for example, alkali metal carbonates or silicates, mono-, di-, or tri-alkali metal orthophosphates, di- or tetra-

alkali metal pyrophosphates, as well as the metaphosphates, known as complexing agents, and furthermore, the water-soluble salts of high-molecular-weight polycarboxylic acids.

There may be mentioned especially polymers of maleic acid, itaconic acid, mesaconic acid, fumaric acid, aconitic acid, and methylene-malonic acid. Copolymers of these acids with one another or with other polymerizable monomers, such as ethylene, propylene, acrylic acid, vinyl acetate, acrylic amide and styrene, are also suitable. As complex-forming builders, the polyphosphates which give an alkaline reaction, especially sodium tripolyphosphate, are particularly useful. Organic complexing agents to be used as builders, are, for example, nitrilotriacetic acid, ethylenediaminetetraacetic acid and similar compounds. Suitable organic and inorganic builders have been disclosed, for example, in "Surface Active Agents and Detergents" Vol. II (1958), pages 289 to 317.

As will be apparent from the above discussion, the compositions provided by the invention are especially important for use in bleaching compositions having detergent properties. These detergent properties can be imparted by the use of a surface active hydrogen peroxide - tertiary amine oxide addition product i.e. there is at least one lipophilic (hydrophobic) group, for example an aliphatic group having more than 7 carbon atoms, attached to the nitrogen of the tertiary amine oxide. As discussed hereinbefore, detergent property can alternatively or additionally be imparted by the use of one or more added detergents in the composition.

Furthermore, products having a stabilizing effect on the peroxy compounds—the products known as stabilizers for peroxy compounds—may optionally be added to compositions provided by the present invention. These stabilizers may be water-insoluble or water-soluble products which are generally added in a proportion of up to about 10 per cent, calculated on the weight of the organic peroxy compounds. As water-insoluble stabilizers for peroxy compounds there may be mentioned especially alkaline earth metal silicates, in particular magnesium silicates. These stabilizers can be obtained in the form of precipitates by adding, for example, calcium salts to aqueous alkali metal silicate solutions. As water-soluble stabilizers, which may be used instead of or along with water-insoluble stabilizers, there may be especially mentioned known organic complexing agents.

The following Examples serve to illustrate the invention, the parts and percentages being by weight unless otherwise stated.

(a) EXAMPLE 1

Preparation of tetradecyl dimethyl amine oxide .H₂O₂ (product A)

120 g of 6.8 per cent hydrogen peroxide were added dropwise, while stirring, to 52 g

of tetradecyl dimethyl amine oxide and 262 g of water in a flask during 30 minutes, at a temperature in the range of from 23 to 25°C.

The dispersion obtained was stirred for 12 hours at room temperature. The precipitate of the hydrogen peroxide addition product obtained from the reaction mixture, which was cooled with ice, was filtered off, was washed with ice cold water until free from peroxide, and was dried at 30°C in a vacuum drier.

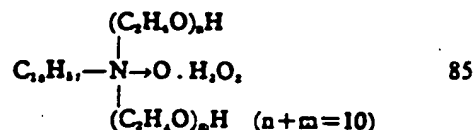
The following products B and C were prepared in an analogous manner.

Product B.

Dodecyl/tetradecyl dimethyl amine oxide .H₂O₂. 80

Product C.

Stearyl amine oxide decyl polyglycol ether .H₂O₂ of the formula



was prepared from Genanin S100 (the corresponding amine oxide).

(Genanin S100 is a Trade Mark).

EXAMPLE 2

a. (Comparison) 90

A heavy duty detergent was prepared by way of spray-drying the detergent raw material and the builder components and by subsequently adding sodium perborate as bleaching agent and tetra-acetyl glycoluril as activator, the detergent composition having the following ingredients:

12.0%	of sodium alkane sulfonate	
4.0%	of sodium salts of a tallow oil acid	
3.0%	of addition compound consisting of 10 mols of ethylene oxide on 1 mol of tallow oil acid mono-ethanol amide	100
38.0%	of sodium tripolyphosphate	
1.0%	of sodium ethylene diamine tetra-acetate	105
1.5%	of carboxy-methyl cellulose (viscosity of the 5% solution at 20°C: 1500 cP)	
0.2%	of optical brighteners	110
5.0%	of sodium metasilicate	
3.0%	of magnesium silicate	
10.0%	of tetra-acetyl glycoluril	
5.6%	of H ₂ O ₂ (as sodium perborate)	
balance to 100%	of sodium sulfate.	115

b. (according to the invention)

By a similar method to that described

under a) above, a composition according to the invention having heavy duty detergent properties was prepared containing product C instead of sodium perborate.

5 c. (Comparison)

By a similar method to that described under a) above, a heavy duty detergent composition was prepared containing hexa - acetyl triethylene tetramine as activator instead of

10 tetra - acetyl glycoluril.

d. (according to the invention)

By a similar method to that described under a) above, a composition according to the invention having heavy duty detergent properties was prepared containing product B instead of sodium perborate, and hexa - acetyl triethylene tetramine instead of tetra - acetyl glycoluril as activator.

15 Cotton cloths soiled by tea were washed with the detergent compositions according to a), b), c), and d) above, with a concentration of 5 g/l and a goods-to-liquor ratio of 1:40 in water of 50° German hardness for 20 minutes, at a temperature of 60°C and were subsequently dried. The washing was performed in the launder-o-meter of the Atlas Electric Devices Company (cf. ASTM bulletin No. 140, 1946).

30 The brightening obtained in the washing processes was determined by way of comparison, by measuring the degree of whiteness with a reflectance photometer (Elrepho of the Zeiss Co.) (cf. Dr. Kurt Lindner, "Tenside, Textilhilfsmittel, Waschrohstoffe", Vol. II, 1964, pp. 1843 and 1844). The results of this comparison are presented in the following Table.

TABLE

Detergent	Brightening in %
a	80
b	86
c	70
d	78

45 The above values indicate that the compositions b) and d) according to the invention result in a better bleaching and washing effect than the preparations a) and c) according to the prior art.

EXAMPLE 3

50 By thoroughly mixing the components, a cleansing powder was prepared which had the following composition:

4.0	of sodium - α - olefine sulfonate
0.5	of addition compound consisting of 9 mols of ethylene oxide on 1 mol of a fat alcohol having from 12 to 15 carbon atoms
2.0	of sodium tripolyphosphate
4.0	of product A

2.0% of hexa - acetyl triethylene tetramine
87.5% of quartz powder. 60

This powder showed a very good cleansing effect. Furthermore, the product—if diluted with water, for example in a ratio of 1:1—effectively destroyed Gram-positive and Gram-negative bacteria. 65

WHAT WE CLAIM IS:—

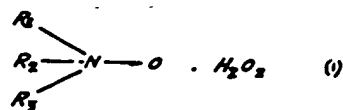
1. A bleaching composition which comprises an addition product of hydrogen peroxide with a tertiary amine oxide and a peroxide activator. 70

2. A composition as claimed in claim 1, wherein at least one of the substituents on the nitrogen atom of the tertiary amine oxide is an aliphatic group of 8 or more carbon atoms. 75

3. A composition as claimed in claim 2, wherein the aliphatic group is a straight or branched chain alkyl group.

4. A composition as claimed in claim 2 or claim 3, wherein the aliphatic group has from 8 to 20 carbon atoms. 80

5. A composition as claimed in claim 1, wherein the addition product of hydrogen peroxide with a tertiary amine oxide is a compound of the general formula (I), 85



in which R₁ represents a straight or branched chain alkyl group of from 8 to 20 carbon atoms; R₂ represents a straight or branched chain alkyl group of from 1 to 20 carbon atoms, or a group of the general formula $-(CH_2CHXO)_nH$, in which X represents a hydrogen atom or a methyl group and n is an integer in the range from 1 to 12; and R₃ represents a straight or branched chain alkyl group of from 1 to 4 carbon atoms, or a group of the general formula 90



in which Y and m have one of the meanings given above for X and n respectively. 100

6. A composition as claimed in claim 5, wherein R₁ represents a straight or branched chain alkyl group of from 12 to 18 carbon atoms. 105

7. A composition as claimed in claim 5 or claim 6, wherein R₁ represents a straight or branched chain alkyl group of from 1 to 4 or of from 12 to 18 carbon atoms.

8. A composition as claimed in any one of claims 5 to 7, wherein R₂ represents a group of the general formula



in which X represents a hydrogen atom or a methyl group and n lies in the range from 1 to 6.

9. A composition as claimed in any one of claims 5 to 8, wherein R₁ represents a group of the general formula $-(CH_2CHYO)_m$, in which Y and m have one of the meanings given in claim 8 for X and n respectively.

10. A composition as claimed in claim 1, wherein the tertiary amine oxide is coconut oil alkyl dimethyl amine oxide, tallow oil alkyl dimethyl amine oxide, stearyl methyl amine oxide polyglycol ether, tetradecyl dimethyl amine oxide, dodecyl dimethyl amine oxide, or stearyl amine oxide decyl polyglycol ether.

11. A composition as claimed in any one of claims 1 to 10, wherein the peroxide activator contains an N - acyl or O - acyl group.

12. A composition as claimed in claim 11, wherein the peroxide activator is N,N - diacetyl - p - chloroaniline, N,N - diacetyl - p - toluidine, diacetylaniline, N,N' - diacetylhydrazine, N,N,N' - triacetylmethylenediamine, tetraacetylmethylenediamine, tetraacetylglycoluril, or hexaacetyltriethylenetetramine.

13. A composition as claimed in any one of claims 1 to 12, which contains from 5 to 30 per cent by weight of the addition product of hydrogen peroxide with a tertiary amine oxide.

14. A composition as claimed in claim 13, which contains from 10 to 20 per cent by weight of the addition product of hydrogen peroxide with the tertiary amine oxide.

15. A composition as claimed in any one of claims 1 to 14, which contains from 5 to 30 per cent by weight of the peroxide activator.

16. A composition as claimed in claim 15, which contains from 10 to 20 per cent by weight of the peroxide activator.

17. A composition as claimed in any one of claims 1 to 16, wherein the weight ratio of the peroxide activator to the addition product of hydrogen peroxide with the tertiary amine oxide lies in the range from 1:1 to 1:2.

18. A composition as claimed in any one of claims 1 to 17, wherein the peroxide activator contains N - acyl or O - acyl groups and the ratio of these acyl groups to active oxygen atoms lies in the range 0.5:1 to 8:1.

19. A composition as claimed in claim 18, wherein the peroxide activator contains N - acyl or O - acyl groups and the ratio of these acyl groups to active oxygen atoms lies in the range from 1:1 to 4:1.

20. A composition as claimed in any one of claims 1 to 19, which contains a surfactant.

21. A composition as claimed in claim 20, which contains from 5 to 40 per cent of surfactants.

22. A composition as claimed in claim 21,

which contains from 10 to 30 per cent of surfactants.

23. A composition as claimed in any one of claims 20 to 22, wherein the surfactant is anionic, non-ionic, or amphoteric.

24. A composition as claimed in any one of claims 20 to 23, wherein the surfactant is a soap, a sulphate, or a sulphonate.

25. A composition as claimed in any one of claims 20 to 22, wherein the surfactant is a non-ionic surfactant containing a moiety of from 8 to 25 carbon atoms and also a polyglycol ether chain.

26. A composition as claimed in any one of claims 1 to 25, which contains a builder.

27. A composition as claimed in claim 26, wherein the builder has a weakly acid, neutral, or alkaline reaction.

28. A composition as claimed in claim 26 or claim 27, wherein the builder is an alkali metal carbonate or silicate, a mono-, di-, or tri-alkali metal orthophosphate, a di- or tetra-alkali metal pyrophosphate, a metaphosphate, a water-soluble salt of a high-molecular-weight polycarboxylic acid, nitrilotriacetic acid, or ethylenediaminetetraacetic acid.

29. A composition as claimed in any one of claims 26 to 28, which contains from 10 to 80 per cent of builders.

30. A composition as claimed in claim 29, which contains from 30 to 75 per cent of builders.

31. A composition as claimed in any one of claims 1 to 30, which contains a peroxide stabiliser.

32. A composition as claimed in claim 31, wherein the peroxide stabiliser is an alkaline earth metal silicate or an organic complexing agent.

33. A composition as claimed in claim 31 or claim 32, which contains up to 10 per cent of peroxide stabilisers relative to the weight of the peroxide.

34. A composition as claimed in any one of claims 1 to 33, substantially as described in any one of Examples 2b, 2d, or 3 herein.

35. A process for oxidising, bleaching, washing, disinfecting, or sterilising a material, wherein the material is contacted with a composition as claimed in any one of claims 1 to 34.

36. A process as claimed in claim 35, wherein the material is treated with a liquor comprising a composition as claimed in any one of claims 1 to 33.

37. A process as claimed in claim 36, wherein the material is treated with an aqueous liquor comprising the composition.

38. A process as claimed in claim 36 or claim 37, wherein the liquor contains from 10 to 500 mg of active oxygen per litre.

39. A process as claimed in claim 38, wherein the liquor contains from 50 to 300 mg of active oxygen per litre.

40. A process as claimed in any one of

claims 35 to 39, wherein the material treated comprises a wax, a fat, an oil, a hydrocarbon, metal, hide, skin, hair, or natural or synthetic fibres suitable for textiles use or in textile form.

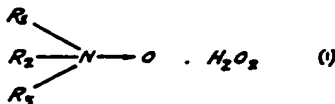
41. A process as claimed in any one of claims 35 to 40, wherein the material treated comprises cellulosic, cotton, linen, polyamide, polyester, or polyacrylonitrile fibres.

42. A process as claimed in any one of claims 35 to 41, which is performed at a temperature in the range from 20°C to 100°C.

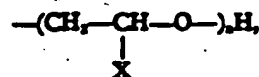
43. A bleaching composition whenever obtained by a process as claimed in any one of claims 35 to 42.

44. A bleaching composition comprising a peroxide activator containing reactive N - acyl groups or O - acyl groups and a surface active addition product of hydrogen peroxide on an amineoxide having at least one lipophilic radical in the molecule.

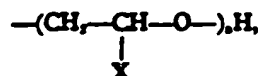
45. The bleaching composition as claimed in Claim 44, containing as hydrogen peroxide addition product a compound of the general formula I



in which R₁ is an alkyl radical having from 8 to 20 carbon atoms, R₂ is an alkyl radical having from 1 to 20 carbon atoms or a radical of the formula



in which X stands for hydrogen or the methyl group, n being in the range of from 1 to 12, and R₃ is an alkyl radical having from 1 to 4 carbon atoms or a radical of the formula



wherein X and n have the above meaning.

46. The bleaching composition as claimed in Claim 44 or 45, wherein the peroxide activator and the surface active hydrogen peroxide addition product are present in a weight ratio of from 1:1 to 1:2.

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